

ANNUAL REPORT 1964

FENELON FALLS

water treatment plant

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1964

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SEP 13 1965
ONTARIO WATER
RESOURCES COMMISSION

DIVISION OF PLANT OPERATIONS

Ontario Water Resources Commission

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ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

Members of the Fenelon Falls Local Advisory Committee,
Village of Fenelon Falls.

Gentlemen:

We are pleased to provide you with the 1964 Operating Report for
the Fenelon Falls Water Treatment Plant, OWRC Project No.
60-W-57.

By continuing the mutual cooperation which has existed in the past,
we can look forward to greater progress in the field of water
supply.

Yours very truly,

D. S. Caverly, P. Eng.,
General Manager

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FOREWORD

This report describes the operation of this project for the year 1964. It includes a detailed description of the project, summary of operation, graphs and charts showing quality and quantity information, and project cost data.

This information will be of value to the municipality in assessing the adequacy of the works in meeting existing requirements and in projecting its capability to meet future expected demands. The cost information will be of particular interest to those concerned with developing and maintaining revenue structures.

The preparation of this report has been a cooperative effort of several groups within the Division of Plant Operations. These include the Statistical Section, Brochures Officer and the Regional Supervisor. However, the primary responsibility for the content has been with the Regional Operations Engineer. He will be pleased to discuss all aspects of this report with the municipality.

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

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FENELON FALLS water treatment plant

operated for

THE VILLAGE OF FENELON FALLS

by the

ONTARIO WATER RESOURCES COMMISSION

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Operations Engineer: J. N. Dick

801 Bay Street Toronto 5

'64 REVIEW

The purpose of this report is to present significant data on the operation of the Fenelon Falls Water Treatment Plant for 1964. Included in the report are figures on costs, flows, and chlorination.

During 1964, 27,881,000 gallons of treated water were pumped to the Village distribution system at a total operating cost of \$6258.23 or \$18.68 per family.

Payroll for both permanent and casual staff amounted to 77 percent of the total operating cost. It should be noted that this cost does not include power costs which are paid for directly by the municipality.

The average daily flow throughout the year was 76,000 gallons per day while the peak was August 9, 1964 with 186,000 gallons per day.

A total of 1167.5 pounds of chlorine was used during 1964 to disinfect the raw water of Cameron Lake.

The Chief Operator should be complimented on his enthusiasm in maintaining and operating the treatment plant and distribution system.

GLOSSARY

BOD	biochemical oxygen demand (a measure of organic content)
cfm	cubic feet per minute
comminution	shredding of solids into small fragments
DWF	dry weather flow
effluent	outflow
flocculation	bringing very small particles together to form a larger mass (the floc) before settling
fps	feet per second
gpcd	gallons per capita per day
gpm	gallons per minute
grit	sand, dust, stones, cinders and other heavy inorganic material
influent	inflow
lin. ft.	lineal feet
mgd	million gallons per day
mlss	mixed liquor suspended solids
ppm	parts per million
ss	suspended solids
TDH	total dynamic head (usually refers to pressure on a pump when it is in operation)

HISTORY

1957 - 1964

INCEPTION

On August 21, 1957, the Village of Fenelon Falls and the Ontario Water Resources Commission initiated plans for the construction of a modern water treatment plant and distribution system. The consulting engineering firm of Franklin McArthur Associates Ltd. was engaged to prepare plans and specifications.

APPROVAL

In early 1961, approval was obtained from the Ontario Municipal Board for the construction of the project. In 1961, the Village signed an agreement with the Ontario Water Resources Commission to finance, construct and operate the plant.

CONSTRUCTION

H. J. McFarland Company of Picton, Ontario, was awarded the contract for the project on March 8, 1961. The Division of Plant Operations of the Ontario Water Resources Commission took over operation of the project when construction was completed on November 1, 1961.

TOTAL COST

The total capital cost of the project was \$303,606.14.



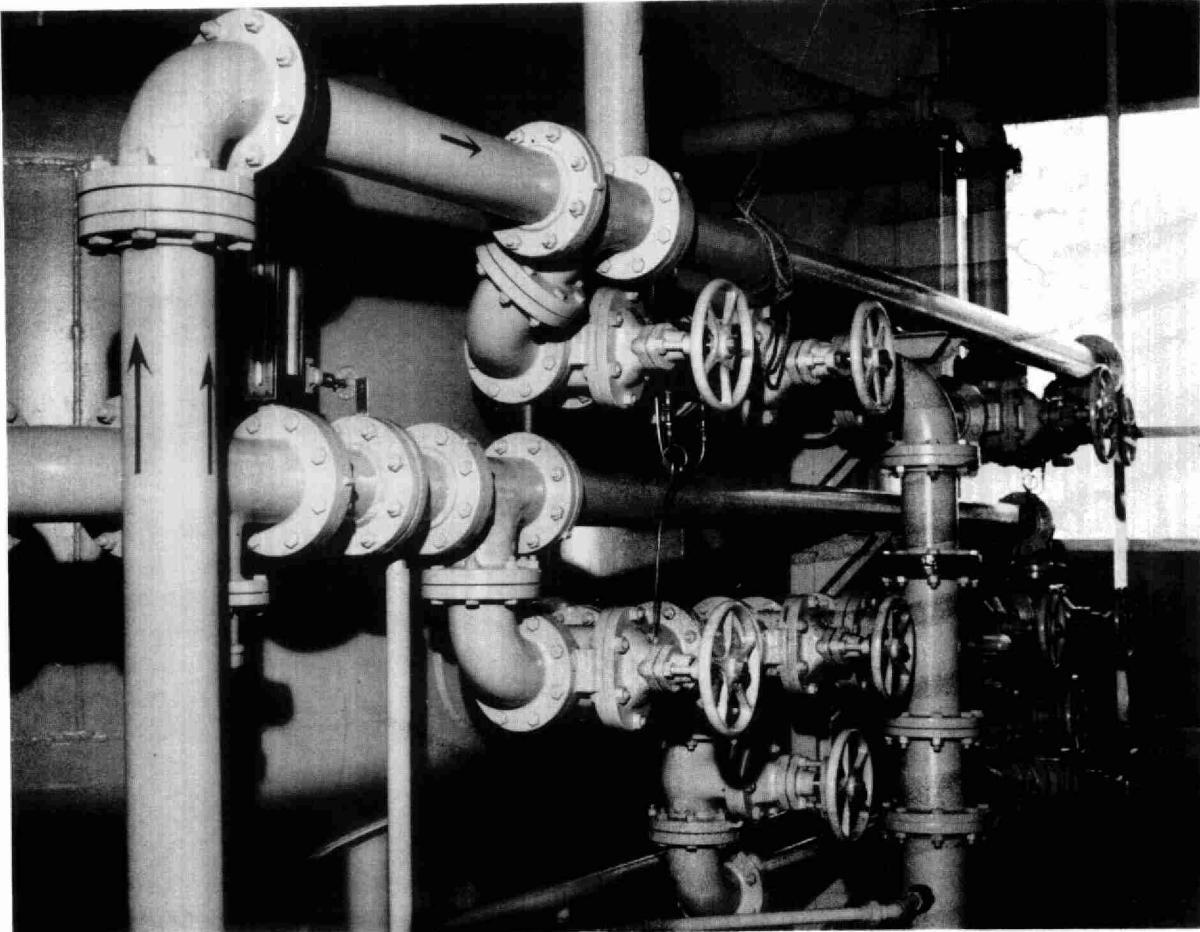
T. BRADBROOKE
CHIEF OPERATOR

Project Staff

COMMENTS

Mr. Bradbrooke was transferred from his job as municipal operator to the Ontario Water Resources Commission staff on March 1, 1962.

Casual labour is required when Mr. Bradbrooke is sick or during his holidays and occasionally when the work load exceeds the operator's capacity.



PIPING AND VALVES FOR OPERATING THE TWO PRESSURE FILTERS

Description of Project

INTAKE

The Fenelon Falls Water Treatment Plant is designed to remove coliform bacteria, algae, and turbidity from the raw water of Cameron Lake. The raw water intake structure is 710 feet off shore and at a depth of 8 feet. From this point, an 18-inch corrugated metal pipe leads to the 14,000 gallon wet well.

In the wet well, the raw water is chlorinated to destroy harmful bacteria before being pumped to the filters. A Fischer and Porter gas chlorinator feeds a chlorine disinfectant solution to the water. The chlorine dosage may be either automatically or manually controlled. When under automatic control, the dosage rate is proportional to the flow through the plant.

PRESSURE FILTERS

Duplicate electrically-driven centrifugal pumps draw the chlorinated water from the wet well and deliver it to the two pressure filters. These filters remove turbidity and algae. During a filter run, the upper layers of the filter gradually become choked with the materials removed from the water. This impedes the efficient flow of water through the filter and it must be backwashed.

Backwash water comes from a clear well which is filled from the delivery main as required. The water in the clear well has been previously filtered and chlorinated. A backwash pump forces water through the filter in a reverse direction and removes any filtered material. The wash water flows to

waste. Backwashing is done in times of low demand so that while one filter is being cleaned, the other can still supply enough flow to the system.

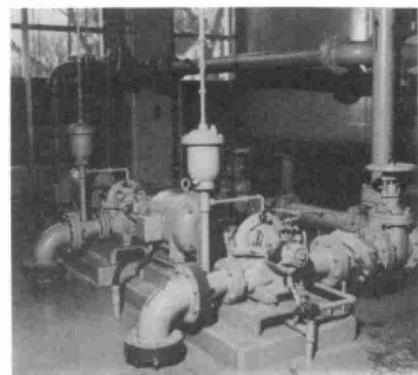
SURGE TANK

A pressurized surge tank floats on the system to reduce the rate of change of flow through the pumps and to minimize water hammer effects. No other storage is provided in the system.

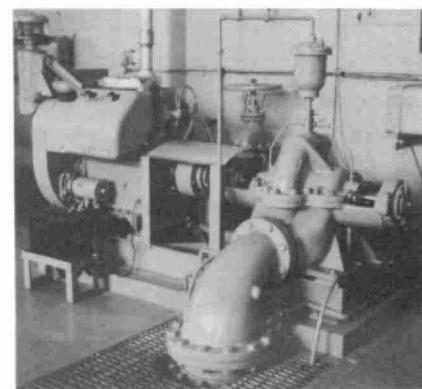
Before leaving the plant, the water passes through an orifice meter which measures the instantaneous flow. A continuous record of this flow is transferred onto a 7-day chart.

If a failure in the main duty pumps should occur, or the pressure in the system should drop to 55 psi, the standby engine and pump will start automatically. This pump is used for fire flows, or in times of power failure, and due to its high capacity, it pumps chlorinated water only, bypassing the filters.

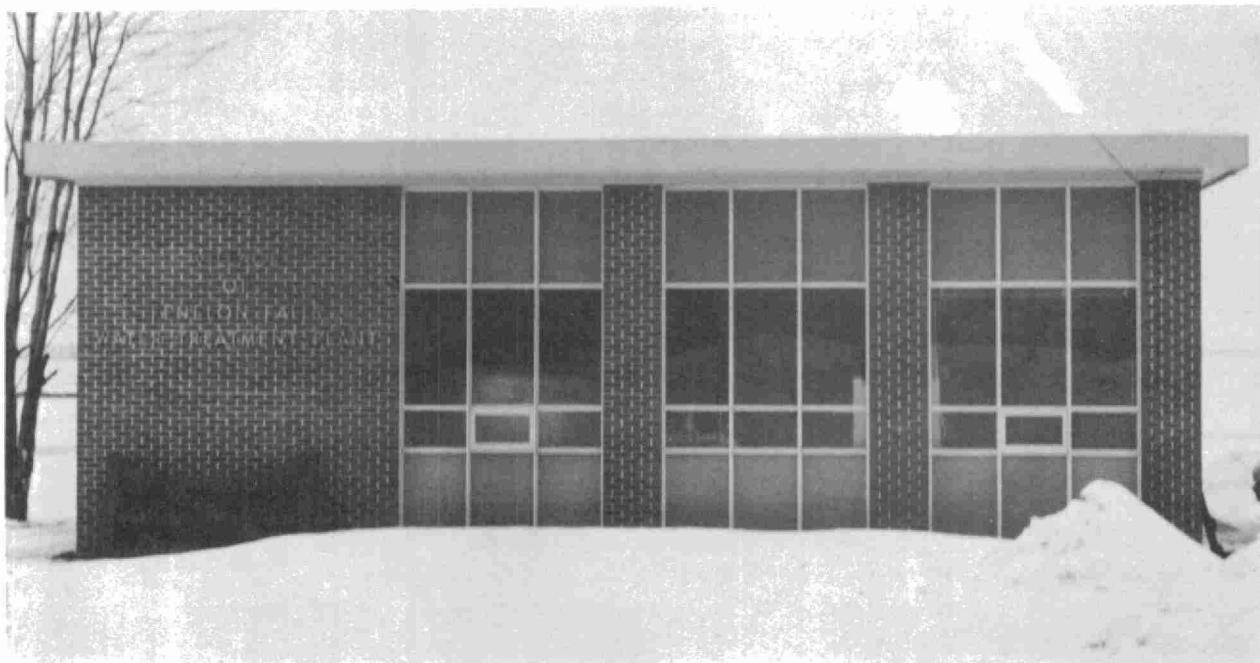
Among other equipment in the plant is an air compressor to maintain an air pressure in the surge tank, and a vacuum primer to keep all pumps primed when not in use.



TWO DOUBLE SECTION DUTY PUMPS,
FOREGROUND, WITH BACKWASH PUMP
IN BACKGROUND



STANDBY FIRE PUMP AND ENGINE



PROJECT COSTS

LONG TERM DEBT: \$301,129.00
(Total Capital Cost)

The total cost to the municipality during 1964 was as follows:

Net Operating	\$ 6,258.23
Debt Retirement	6,077.00
Reserve	2,190.00
Interest Charged	16,941.62
<hr/>	
TOTAL	\$ 31,466.85
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RESERVE ACCOUNT

Balance at January 1, 1964	\$ 4,573.19
Deposited by municipality	2,190.00
Interest Earned	298.47
<hr/>	
	\$ 7,061.66

Less Expenditures -

Balance at December 1, 1964	\$ 7,061.66
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DEBT OUTSTANDING: \$298,062.63

MONTHLY COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDY
JAN	454.05	292.14	106.58				22.31		13.34	19.68
FEB	580.23	292.14	202.64				17.48	37.53	15.36	15.08
MARCH	541.36	327.47	114.14				14.44			85.31
APRIL	438.20	306.12					21.68		(9.68)	120.08
MAY	710.34	456.48	30.60			173.13	25.92	11.59	12.62	
JUNE	405.25	357.56								47.69
JULY	412.52	307.92	65.92				25.40			13.28
AUG	461.71	329.52	60.92				57.99			13.28
SEPT	636.71	367.32				(70.00)	22.65	165.21	67.39	84.14
OCT	449.99	354.72						53.77	4.27	37.23
NOV	382.79	304.32	63.15			(105.00)	61.60	10.12	48.60	
DEC	785.08	456.48				33.13	22.11	51.45	155.76	66.15
TOTAL	6258.23	4152.19	643.95			31.26	291.58	329.67	307.66	501.92

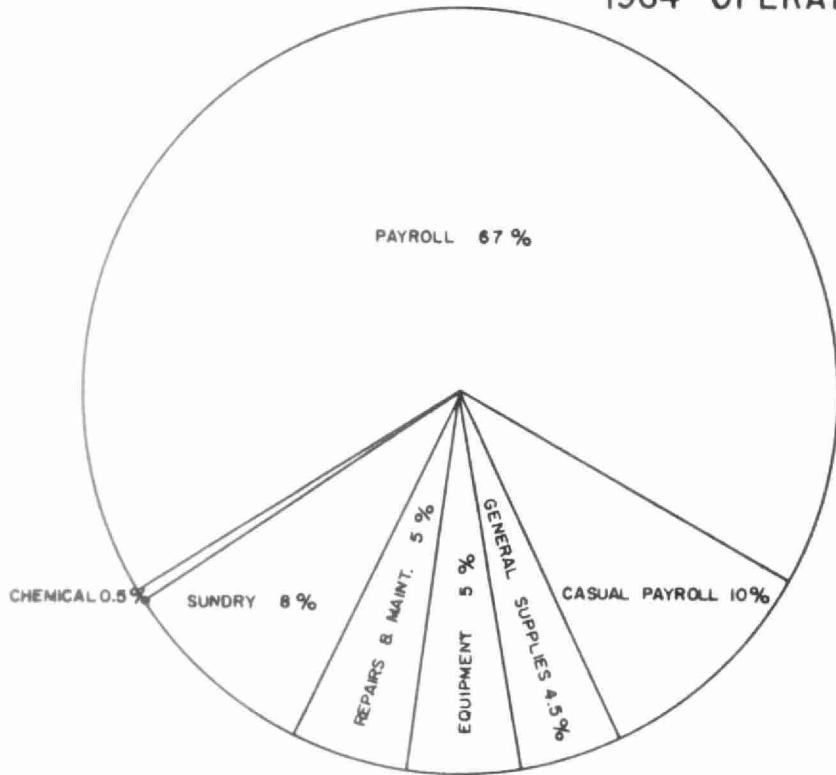
BRACKETS INDICATE CREDIT

YEARLY COSTS

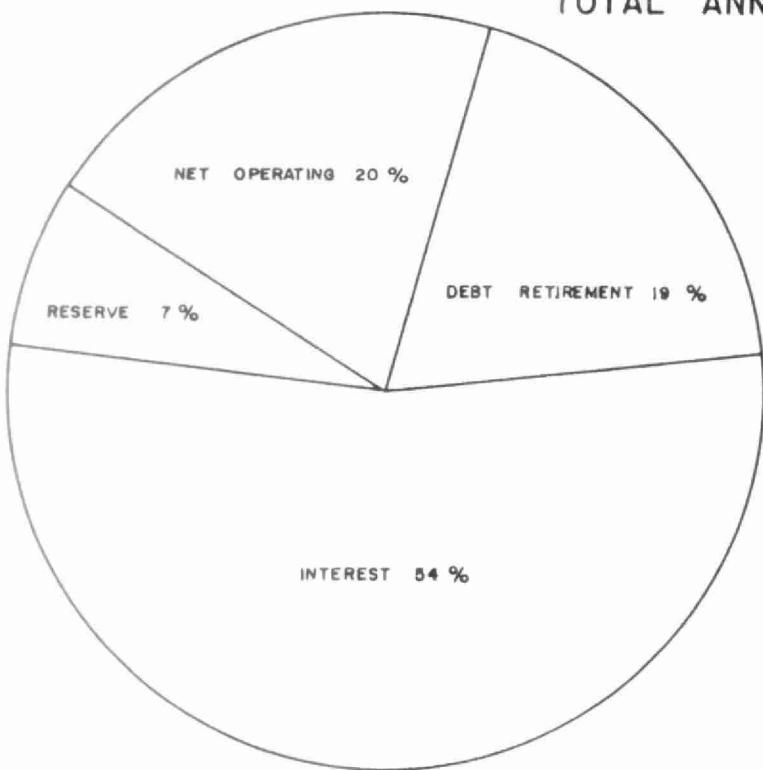
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS
1964	27,881	\$6258.23	* 18.68	\$224.46

* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

1964 OPERATING COSTS



TOTAL ANNUAL COST



***Technical
Section***

Design-Data

GENERAL

Design Population - 1300 persons

Design Plant Flow - 130,000 gallons per day.

Per Capita Flow - 100 gallons per day.

Wet Well Capacity - 14,000 Imperial gallons.

Clearwell Capacity - 5800 Imperial gallons.

DUTY PUMPS

Two Allis-Chalmers double suction centrifugal pumps. Model SJH, size 2 1/2 x 2, 204 USGPM at 175 ft. head, 3525 rpm.

Motors - Canadian Allis-Chalmers type ML, frame 256U, 550 volts, 3 phase, 15.0 amps., 15 hp, 3517 rpm

BACKWASH PUMP

One Canada Pump single suction centrifugal pump. Model 5CCS, close coupled drive, 612 USGPM at 40 ft. head.

Motor - Tamper type BGK-51110, 550 volts, 3 phase, 10.0 amps., 10 hp., 1735 rpm.

STANDBY AND FIRE PUMP

One Babcock-Wilcox and Goldie McCulloch single stage double suction centri-

fugal pump. 835 IGPM at 150 ft. head, 1750 rpm.

Drive - Wisconsin engine model VR4D, 4 1/4 inch bore, 4 1/2 inch stroke, 255 cu. in. displacement.

PUMP PRIMER

One Valve and Primer Corporation (W-APCO) automatic vacuum pump primer. Horizontal 16" x 30" vacuum storage tank. Leinman #26 - 1 1/2, 2.5 cfm. vacuum pump.

Motor - Masters 1/4 hp, single phase, 60 cycle, 110 volt, 1750 rpm., V-belt drive.

PRESSURE FILTERS

Two Infilco rapid sand pressure filters. Each filter rated at 126 Imperial gallons per minute per square foot of filter area at a pressure of 75 psi.

SURGE TANK AND COMPRESSOR

Tank capacity - 2300 U.S. gallons. Brunner air compressor, Model H30.

Motor - Robbins and Myers type N, frame 213, 550 volt, 3 phase, 3.5 amsp. 3 hp, 1725 rpm.

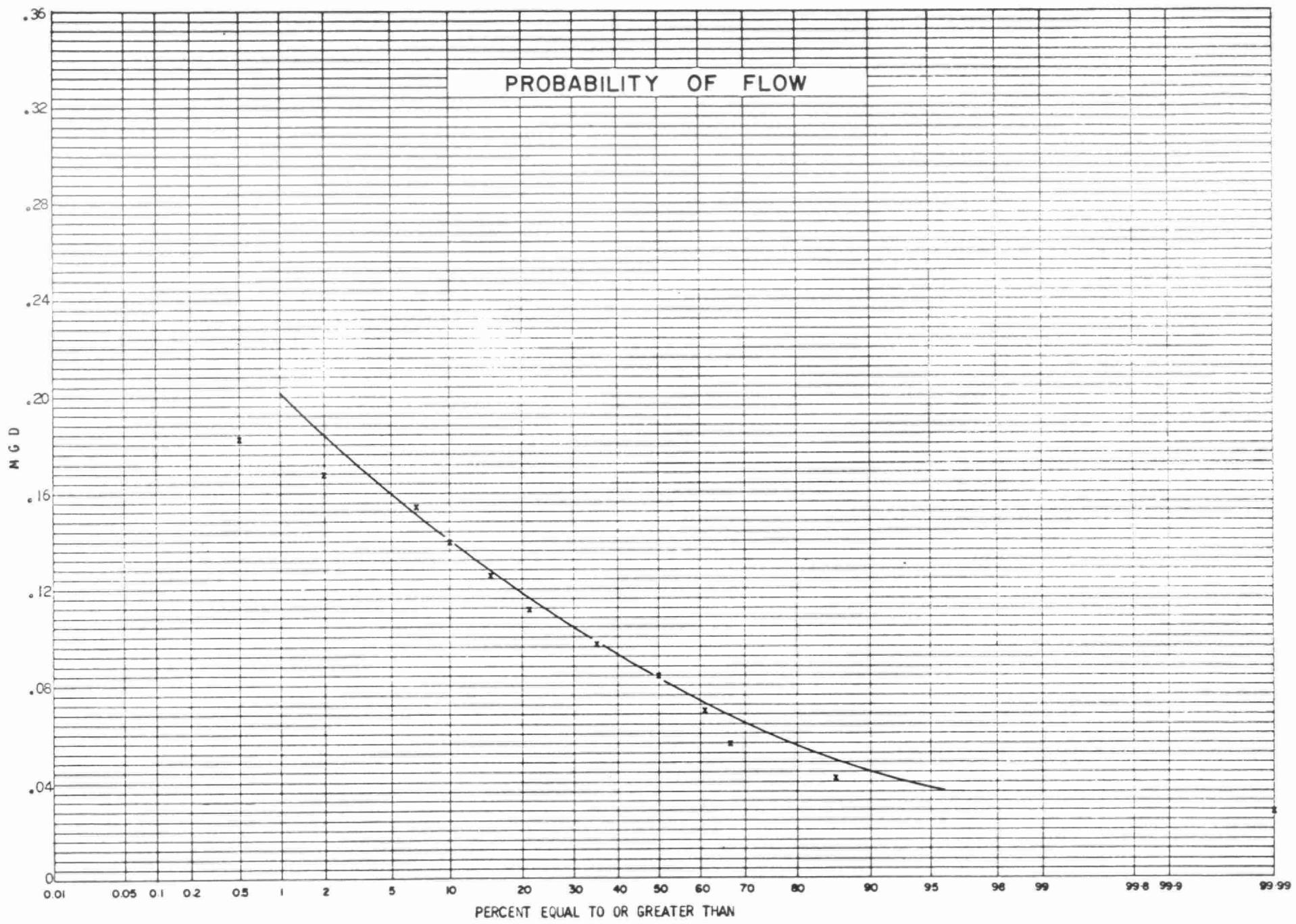
CHLORINATOR

Fischer and Porter Model C-1420. Automatic proportioning chlorinator.

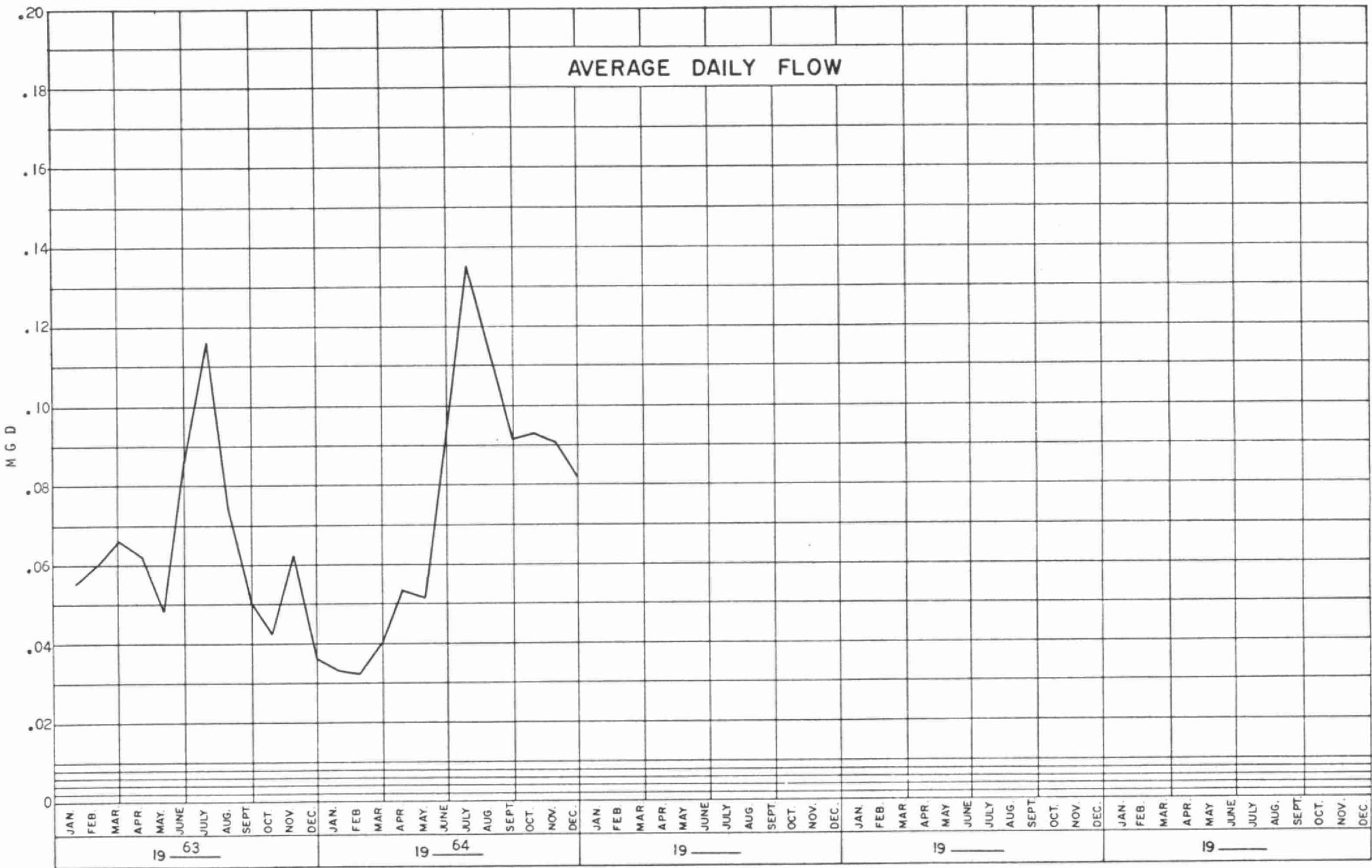
Process Data

From the graph of average daily flow, it can be seen that the month of July has given a peak demand in both 1963 and 1964. In 1964, the month of February had the lowest average daily flow of 32,000 gallons per day while July had the highest with 135,000 gallons per day. This peak is due not only to the normal high demand of the warm summer months, but also to an influx of cottagers to the Village.

The probability plot reveals that for fifty percent of the time, the average daily flow exceeds 83,000 gallons per day and that for ten percent of the time, it is in excess of 140,000 gallons per day.



AVERAGE DAILY FLOW



CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	1.019	54.0	5.30
FEBRUARY	.942	62.0	6.58
MARCH	1.251	60.5	4.84
APRIL	1.609	77.0	4.78
MAY	1.595	109.0	6.83
JUNE	2.734	138.0	5.05
JULY	4.226	168.0	3.98
AUGUST	3.563	141.0	3.96
SEPTEMBER	2.768	111.0	4.01
OCTOBER	2.898	94.0	3.24
NOVEMBER	2.719	76.0	2.80
DECEMBER	2.557	77.0	3.01
TOTAL	27.881	1167.5	
AVERAGE	2.323	97.3	4.19

COMMENTS

In maintaining a chlorine residual of 0.5 parts per million in the treated water during 1964, a total of 1167.5 pounds of chlorine were used giving a dosage rate of 4.19 parts per million in the raw water.

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CONCLUSIONS

The total 1964 operating cost for the Village of Fenelon Falls Water Treatment plant was \$6258.23.

The plant was maintained and operated in an efficient manner, pumping a total of 27,881,000 gallons into the system.

As the plant flow sometimes exceeds the design capacity of one pump particularly during the summer months, it is proposed to install automatic control of the second pump. This will involve the purchases of telemetering equipment and several modifications to the present pump controls. It is hoped that this work will be completed during 1965.

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